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10/670,291

09/26/2003

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT

PAPER NUMBER

1756

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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3 MONTHS

03/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/670,291

Applicant(s)

KOZAWA ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-5, 7-8, and 13-14, are rejected under 35 U.S.C. 102(a) as being anticipated by U. S. Patent No. 6,410,677 (Enoki et al., hereinafter referred to as Enoki).

Enoki, in the abstract, in col 2, lines 35-45, and lines 63-67, in col 3, lines 1-3, in col 4, lines 40-63, discloses a water-soluble composition for a coating material that includes a resin (water-soluble), a surfactant, and an optional organic solvent. Enoki does not refer to the material composition taught therein as "a resist pattern thickening material" however the material composition taught by Enoki comprises the same components required in the present material composition and is therefore expected to be capable of performing the same intended use. See *In re Hirao*, 535 F.2d 67, 190 USPQ 478, 481 (CCPA 1951) (claims 1, 2, 5, 13). Enoki, in col 2, lines 63-67, and in col 3, lines 1-30, discloses that the surfactant is either a non-ionic surfactant such as polyoxyethylene alkyl ether, or a cationic surfactant such as an alkyl amine salt, or an amphoteric surfactant such as betaine (claims 3-4). Enoki, in col 4, lines 38-46, discloses a resin that has a cyclic structure and is a heterocyclic polybenzoxazole resin (claims 7-8). Enoki, in col 4, lines 54-63, discloses that the organic solvent is a chain ether solvent viz., diethylene glycol dimethyl ether (claim 14).

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5-8, 13-18, are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Application Publication No. 2001-109165 (Kanda et al., hereinafter referred to as Kanda).

Kanda, in the abstract, in [0001], [0013], [0017], [0019], [0020], discloses a coating material that fattens the resist pattern (resist pattern thickening material) comprising a water-soluble resin, a non-ionic surfactant, and an organic solvent (claims 1-3, 5, and 13). Kanda, in [013], discloses that the water-soluble resin of the coating material is a polyvinyl alcohol (claim 6). Kanda, in [0013], discloses that the water-soluble resin is a heterocyclic compound such as a polyvinyl pyrrolidone (has a cyclic structure) (claims 7-8). Kanda, in [0020], discloses that the organic solvent is an alcohol solvent (claim 14). Kanda, in the abstract, in [0002], [0011], [0012], [0013], [0019], [0020], [0033], discloses forming a resist pattern (resist pattern to be thickened) for a semiconductor device, forming a coating material (enveloping layer, reference 3 of figures 1, and 2) on the formed resist pattern, wherein the coating material (resist pattern thickening material) fattens the resist pattern, said coating material includes a resin, a surfactant, and an organic solvent (claims 15-16, and 18). Kanda, in [0022], [0023], [0024], discloses that the developing processing is performed after the formation of the coating material on the resist pattern (claim 17).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 19-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication No. 2001-109165 (Kanda et al., hereinafter referred to as Kanda) in view of U. S. Patent No. 6,319,853 (Ishibashi et al., hereinafter referred to as Ishibashi).

Kanda, in the abstract, in [0002], [0011], [0012], [0013], [0019], [0020], [0033], discloses forming a resist pattern (resist pattern to be thickened) for a semiconductor device, forming a coating material (enveloping layer, reference 3 of figures 1, and 2) on the formed resist pattern, wherein the coating material (resist pattern thickening material) fattens the resist pattern, said coating material includes a resin, a surfactant, and an organic solvent (claim 19). Kanda, in [0011], discloses that the resist material (for forming the resist pattern, the resist pattern to be thickened) is an acrylic resist (claim 20).

The difference between the claims and Kanda is that Kanda does not disclose using the resist pattern to pattern the underlying layer.

Ishibashi, in col 24, lines 2-25, discloses that the thickened resist pattern (second resist pattern, after developing the coating material formed on the resist pattern) is used as an etching mask to etch the underlying layer (semiconductor substrate).

Therefore, it would be obvious to a skilled to employing the etch process suggested by Ishibashi because Kanda, in [0002], discloses that the resist pattern formed can be used as an etching resist mask to manufacture semiconductor devices and circuit boards.

Response to Arguments

7. Applicant's arguments filed December 22, 2006, have been fully considered but they are not persuasive. The 102 and 103 rejections made in the previous office action (paper no. 20060817) are maintained.

A) Applicants argue that Enoki et al., does not disclose a resist pattern thickening material which is capable of thickening a resist pattern to be thickened.

Enoki et al., teaches a coating material composition that has a resin and a surfactant and an organic solvent material as recited in claim 1 i.e., Enoki et al's coating material composition comprises the same components as the claimed resist pattern thickening material and is therefore capable of performing the claimed task. In response to applicant's argument that Enoki et al., does not disclose a resist pattern thickening material which is capable of thickening a resist pattern to be thickened a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

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B) Applicants argue that Kanda et al., requires a cross-linking agent and therefore does not anticipate the claims.

The claims recite a resin, a surfactant, and optionally an organic solvent, a thermal acid generator, and quenchers. Kanda discloses a resist pattern thickening material that has a resin, a surfactant, and an organic solvent. Kanda, in [0012], discloses that the crosslinking agent is only optional i.e., "if needed a desirable thing" and therefore Kanda's resist pattern thickening material can be used without the crosslinking agent. Additionally, the claims as recited requires a resin component, and the resin claimed includes melamine resin i.e., the resin itself performs as a crosslinking agent especially with the claimed optional thermal acid generator that performs the crosslinking process with the resin (melamine resin). Furthermore, Kanda, in [0013], and [0014], teaches the use of a melamine resin as the resin component and also teaches that melamine resin can also be used as a crosslinking agent.

Conclusion

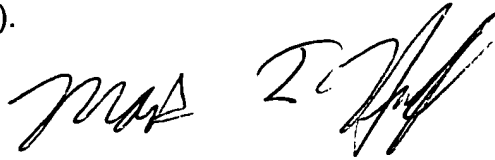
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent

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Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

March 15, 2007.

Handwritten signature and date "MAR 20 2007".

LOUIS F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700